

0400395- Hopi High School - BIA

Storage Tank Deficiency

Issue Description

The overflow for the elevated storage tank is stubbed out near the foundation of the tank where a splash pad has been installed to prevent erosion and protect the tank's foundation. The overflow is screened but the openings in the screen are too large to prevent the entry of water-seeking insects like bees and wasps.

Recommended Corrective Action

The screen should be replaced with a non-corrodible screen with openings no larger than 12-mesh (12 openings per inch both vertically and horizontally). The existing screen appears to be 4-mesh.

Another acceptable method of providing protection for overflows is to install a weighted flap gate. In theory, the flap gate will open to allow overflowing water to escape and then will close when the overflow ceases. An example of a flap gate is shown in Figure 2 below. Note that Figure 2 shows the end of the overflow pipe has been cut at a slight angle to ensure a more tightly closing valve. Some regulatory agencies prefer to have overflows with both a flap gate and internal insect screen. Regardless of the method selected to protect overflows from insects and vermin, regular inspection and maintenance is required. Screens corrode and need regular replacement and flap gates need to be lubricated and cleaned to ensure free movement and sealing.

Priming the Pump

Issue Description

Per the operator, PF001's pump has to be primed every time water is pumped from ST002 into the distribution system. The pump is primed with water from the distribution system provided through a hose that was coiled up on the floor of the treatment building during the sanitary survey. This process offers opportunities for contamination of the water system.

Given the current design with an above grade pump and a fully buried storage tank, this may not be a problem that is easy to correct. Until it can be corrected, a standard operating procedure (SOP) needs to be developed that minimizes the opportunities for contamination of the water during the pump priming process.

Recommended Corrective Action

A standard operating procedure should be developed to ensure that the water system is not contaminated during the pump priming process. Things to consider when designing the SOP include:

- a. The conduit used to carry water from the distribution system to the point where the water is introduced for priming the pump should be designed for use with drinking water. Ideally it should be NSF- certified for use with potable water.
 - b. The conduit should not be used for any other purpose and should be drained after each use.
 - c. The conduit should be flushed to waste before each use.
 - d. Both ends of the conduit should be capped when not in use.
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Please consult regarding these proposed corrective actions and negotiate reasonable due dates and specific actions.

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Full-time Disinfection

Issue Description

The operator said that he prepared the chlorine day tank solution by mixing one gallon of 12.5 percent sodium hypochlorite solution with approximately 135 gallons of water. This produces a highly diluted chlorine solution and no chlorine residual could be measured at the treatment plant or in the distribution system. This issue was discussed during the sanitary survey and SGEC recommended changing the dilution process to achieve somewhere between a one and two percent solution.

Recommended Corrective Action

SGEC recommends mixing the 12.5 percent sodium hypochlorite solution at a ratio of one gallon of sodium hypochlorite solution to 12 gallons of water to get approximately a one percent solution. Then, the metering pump's feed rate should be adjusted to the point where a chlorine residual of approximately 1.0 mg/L is achieved in the effluent from PF001. Over time, the metering pump's feed rate can be adjusted as necessary to ensure that there is always a minimum of 0.20 mg/L free chlorine residual at all points in the distribution system. For the first few months following these adjustments in the chlorine feed rate, daily chlorine residuals should be taken in the distribution system with the results recorded and submitted to the EPA Region 9 program manager at the end of each month. Most of the chlorine residual measurements should be taken in the school building(s) where students and staff are normally served. However, SGEC recommends that at least one residual measurement per week be taken (and recorded) at the furthest point in the distribution system.

The operator reported that a few water users had complained about chlorine tastes and/or odors. SGEC believes it's worthwhile to point out that tastes and odors are more obnoxious at very low chlorine residuals than when there is a measurable free chlorine residual. This is because chlorine reacts with organics in the water, either originating from the well water or from biofilms in distribution and storage, to produce mono-, di- and tri-chloramines. Dichloramines and trichloramines have obnoxious tastes and odors. If enough chlorine is injected to pass the break point and produce a free chlorine residual, the bad tastes and odors are significantly diminished. Some people will be able to get a slight chlorine odor from off-gassing, but they can be advised to put a pitcher of water in the refrigerator and that odor will be lost as the gas escapes.

Use of Arsenic Non-Compliant Ground Water Source

Issue Description

Historic arsenic monitoring data from GW001 show arsenic levels ranging from 18-19 micrograms per liter, which exceeds EPA's primary drinking water standard for arsenic of 10 micrograms per liter. Per EPA Region 9, sample dates showing MCL exceedences include: 5/25/2010, 10/20/2009 and 12/26/2001. Water from GW001 is not treated for arsenic prior to entering the distribution system. The water operator stated that the PWS utilizes this well approximately 30 days per year.

Recommended Corrective Action

If the well is used, its entry point should be monitored in accordance with an EPA Region 9-approved monitoring schedule and treatment should be provided for arsenic removal. The EPA Region 9 program manager should be provided with a plan and schedule to ensure compliance.

Please consult regarding these proposed corrective actions and negotiate reasonable due dates and specific actions.